Small Business Innovation Research/Small Business Tech Transfer

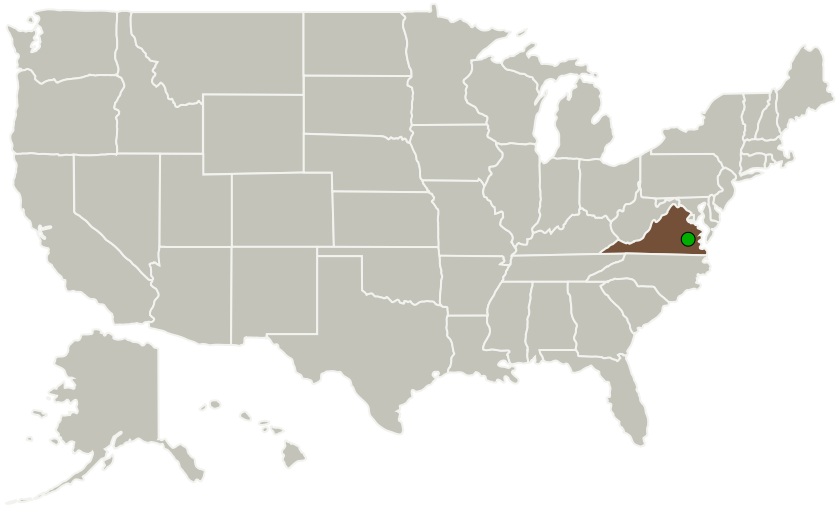
Space Station Validation of Advanced Radiation-Shielding Polymeric Materials, Phase II

Completed Technology Project (2013 - 2018)

Project Introduction

In Subtopic X11.01, NASA has identified the need to develop advanced radiation-shielding materials and systems to protect humans from the hazards of space radiation during NASA missions. The radiation components of interest include protons, alpha particles and heavy ions from galactic cosmic rays, protons and other ions from solar particle events, high energy electrons and neutrons, and high-energy electromagnetic radiation. International Scientific Technologies, Inc., in conjunction with the College of William and Mary, proposes to raise the technology readiness level of selected polymeric radiation-shielding materials through participation in the Materials on the International Space Station Experiment program, named MISSE-X. The Phase I SBIR program demonstrated the feasibility of developing a flight-qualified Technology Demonstration Experiment to be carried on board the ISS as part of a MISSE-X payload to facility Technology Infusion. Phase II Technical Objectives will include specification and fabrication of polymeric materials to shield astronauts and sensitive electronic equipment, acquisition and test of detectors/dosimeters suitable for measurement of total ionizing dose, design, construction, test and optimization of an experimental package compatible with the guidelines and specifications of the MISSE-X program, and field testing and integration in conjunction with NASA personnel and NASA contractors. The anticipated result of the Phase II program is the delivery of an experiment package for MISSE-X.

Primary U.S. Work Locations and Key Partners



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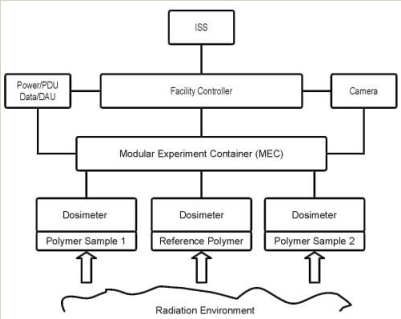
Organizations Performing Work	Role	Type	Location
International Scientific Technologies, Inc.	Lead Organization	Industry	Dublin, Virginia
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations
Virginia

Images



Briefing Chart
Space Station Validation of Advanced Radiation-Shielding Polymeric Materials, Phase II
(https://techport.nasa.gov/image/130616)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
International Scientific Technologies, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Russell J Churchill

Co-Investigator:
Russell Churchill

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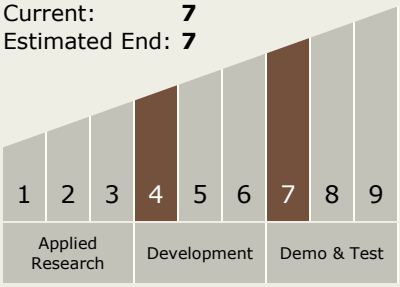
Technology Maturity (TRL)

Start: **4**
Current: **7**
Estimated End: **7**



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.5 Radiation
    - TX06.5.3 Protection Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System